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If x increases these points move towards the left along straight lines through the origin, and the hyperbolas corresponding to two values of x are homothetic with respect to the origin.

The interesting point about the equations is the nature of the coefficients of h.

It is further interesting to notice those points on the hyperbola which may be used when the conditions of the law of the mean are satisfied: that is, when θ is positive and less than one, or when ϕ is numerically less than h, and has the same sign. Also, notice may be made of these relations when the point on the cubic whose abscissa is x, is to the left of the inflection point, coincides with the inflection point, or is to the right of it.

RECENT PUBLICATIONS.

REVIEWS.

The Early Mathematical Manuscripts of Leibniz translated from the Latin texts published by Carl Immanuel Gerhardt with critical and historical notes. By J. M. Child, Chicago-London, The Open Court Publishing Co., 1920. Price $2.00.

American readers will be glad to possess in English translation the manuscripts of Leibniz containing his early work in the creation of the calculus that were preserved in the Royal Library in Hanover and were first published by C. I. Gerhardt in the years 1846–1855. We have here seventeen manuscripts bearing dates which fall within the time 1673–1677 and also two manuscripts of later date which give two accounts, one brief, the other more extended, of the origin of the calculus—both from the pen of Leibniz himself. Child breaks the chronological order by printing the last two documents first, thus laying stress on the parts which after all are really less important; for it is the papers of 1673–1677 that contain the cardinal points of the record. The book begins with the controversy on the priority of discovery which, by rights, should have been postponed to the end. Child translates also Gerhardt's essay on "Leibniz in London," which includes three manuscripts of Leibniz, and a second essay by Gerhardt, on "Leibniz and Pascal." Child adds profuse historical notes and arguments.

As a rule, the style is clear, but we mention a few exceptions. On page 8, line 23, a sentence is quoted, but it does not clearly appear which of three men mentioned is the author of it; only by inference from what follows later can the reader place the author with certainty. On the same page, line 26, Child quotes from "the memoir referred to," when as yet, no memoir has been mentioned; the authorship of the quotation at the bottom of page 8 is not revealed in the text.

In some instances Child is guilty of inconsistencies and errors. On page 9 he gives 1708, instead of 1704, as the date of the first complete publication of Newton's *Tractatus de quadratura curvarum.* On page 13, line 38, the date of the second edition of Barrow's *Lectiones Opticæ et Geometricæ* is given as 1874; of course, it should be 1674. On page 6 Child declares that Fatio concludes that

Leibniz, as the second discoverer of the calculus, "has borrowed from Newton," while on page 9 Child says, "Fatio does not dare to make a direct assertion, only an insinuation."

Some of the footnotes contain conjectures relating to historical events and the motives which prompted the movements of the actors. These conjectures are of value, provided the rapid reader does not lose sight of the fact that they are only conjectures. Indeed, some of Child's contentions are far from convincing. Take the matter of the "Characteristic triangle." Leibniz used it but does not claim it as his own. He says he got it from Pascal. Child argues that Leibniz must have gotten it from Barrow, on the ground that Leibniz obtained a copy of Barrow's *Lectiones Opticæ et Geometricæ* a month or so before he got a copy of Pascal, and that Leibniz's geometrical figure more closely resembles Barrow's than that of Pascal. Child may be correct in his view that for geometrical knowledge, Leibniz was indebted to Barrow more deeply than is ordinarily believed.

As regards the Newton-Leibniz controversy, Child agrees with A. De Morgan in characterizing the publication of the *Commercium epistolicum* by the Royal Society of London as an act of disgraceful unfairness; Child discards the hypothesis that Leibniz took his calculus from Newton, and says: (p. 5) "I hold quite other views as to the possible source of Leibniz's inspiration, if indeed he is not to be credited with perfectly independent discovery."

There are a few American reviewers who unconsciously have acquired the mannerism of belittling American contributions to the history of science and extolling foreign ones. While in the past, the present reviewer may have exhibited an exactly opposite tendency, he has no hesitation in this case to express the opinion that students of the history of mathematics will feel greatly indebted to Child for his translations and for his conscientious, fair-minded and thorough study of the documents involved.

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Infinitesimal Calculus. By F. S. CAREY. (Longmans Mathematical Series.) London, Longmans, 1919. 8vo. 20 + 352 + 9 pages. Price 14 shillings.

How far should one go in introducing new ideas at the beginning of a first course in the calculus? And how much time can one afford to spend in explaining those ideas? It is in answering these two questions that the text before us differs most radically from our standard texts. Most writers seem to agree that while in an introductory course the notions of variable, function and limit must be discussed, a very brief discussion is best, introducing as little notation and as few new terms as possible, with the thought presumably that those notions will become most rapidly and truly understood through use.

The attitude of the author is given in the preface. "Believing that there is no royal road which leads smoothly and directly to the Infinitesimal Calculus, the author has made no attempt to evade all the difficulties which at the outset face the student in this subject. The road has, however, been laid in the first